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ABSTRACT

This fact sheet defines vision, outlines the visual skills needed for school achievement (ocular motility, binocularity, eye-hand coordination skills, and visual form perception), and describes how visual problems are evaluated and treated. The fact sheet also lists clues to look for when a visual problem is suspected, including the appearance of the eyes, complaints when using eyes for desk work, and behavioral signs. (JDD)

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ERIC Clearinghouse on Handicapped and Gifted Children

FACT SHEET

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LEARNING RELATED VISUAL PROBLEMS

What is vision?

Vision is a cognitive act which enables us to look at an object and not only identify it, but to determine where it is, its size, its distance from the observer, its rate of movement, its texture, and everything else that can be determined by visual inspection. Eyesight which involves the sensory ability of the eye to distinguish small details is only one component of vision.

It has been estimated that 75 to 90% of all of classroom learning comes to the student via the visual pathways. If there is any interference with these pathways, the student will probably experience difficulty with learning tasks.

What visual skills are needed for school achievement?

Eye Movement Skills (Ocular Motility). To obtain the greatest amount of information in the shortest time and with the least effort, the eyes must be able to scan with speed and control. If eye movements are slow, clumsy, or uncoordinated—e.g. if the eyes jump, miss, 'stutter' or lose their place on instructional materials—the amount of information obtained will be reduced.

Eye Teaming Skills (Binocularity). The human visual system is designed so that the paired eyes and all of their reciprocating muscles work as a team. All judgments of spatial orientation, relationships, depth perception and, more important, the immediacy and accuracy of clear, single vision for almost every object or symbol, depends on the paired action of the eyes.

Eye-Hand Coordination Skills. This ability and any proficiency a child may attain in this area is dependent upon the use, practice, and integration of the eyes and the hands as paired learning tools. Out of this practice emerges the ability to make visual discriminations of size, shape, texture, and location of objects. This skill is developmentally essential and preparatory to both reading and writing.

Visual Form Perception (Visual Comparison, Visual Imagery, Visualization). The child's first symbols are images and pictures which allow him to mentally hold fleeting reality. This skill of visual imagery allows the child to relate primary experiences to the pictures and words seen on the printed page. Skillful action in the previous three areas provides perceptual information that permits the translation of object size, shape, texture, location, distance, and solidarity into understood pictures and words. Visual form perception is a derived skill, not a separate and independent ability. Its ultimate purpose is the immediate and accurate discrimination of visible likenesses and differences, so comprehension can be immediately followed by appropriate actions.

How are visual problems evaluated?

A comprehensive analysis of a person's visual functioning should include an eye health evaluation, measurement of visual acuity and refractive status (nearsightedness, farsightedness, and astigmatism). Of equal importance, the analysis must determine how both eyes work together as a team, how the eyes aim and focus together, and how well clear, single vision can be sustained, especially at a near-point reading task. With the underlying philosophy that vision is a process involving an input, a computing, an output, and then a feedback mechanism, the goal of the analysis should be to determine whether the visual system is effectively processing information. As vision is used to guide, steer, and appraise what we do in our everyday life, the analysis should be done under natural conditions, without the use of any cyclopelegic (paralyzing) eye drops.

How are visual problems treated?

Optometric treatment for a vision dysfunction may include the use of lenses, prisms, visual training programs, and developmental vision guidance. In addition, specific recommendations may also be made concerning general health and nutrition.

What are the clues to look for when a visual problem is suspected?

The following clues to classroom visual problems were compiled by the Optometric Extension Program Foundation, Inc. Children observed to exhibit these signs should be referred for a developmental vision evaluation.

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1. *Appearance of Eyes*
   - One eye turns in or out at any time.
   - Reddened eyes or lids.
   - Eyes tear excessively.
   - Encrusted eyelids.
   - Frequent sties on lids.

2. *Complaints When Using Eyes at Desk*
   - Headaches in forehead or temples.
   - Burning or itching after reading or desk work.
   - Nausea or dizziness.
   - Print blurs after reading a short time.

3. *Behavioral Signs of Visual Problems*

   A. Eye Movement Abilities (Ocular Motility)
   - Head turns as reads across page.
   - Loses place often during reading.
   - Needs finger or marker to keep place.
   - Displays short attention span in reading or copying.
   - Too frequently omits words.
   - Repeatedly omits "small" words.
   - Writes up or down hill on paper.
   - Rereads or skips lines unknowingly.
   - Orients drawings poorly on page.

   B. Eye Teaming Abilities (Binocularity)
   - Complains of seeing double (diplopia).
   - Repeats letters within words.
   - Omits letters, numbers, or phrases.
   - Misaligns digits in number columns.
   - Squints, closes, or covers one eye.
   - Tilts head extremely while working at desk.
   - Consistently shows gross postural deviations at desk activities.

   C. Eye-Hand Coordination Abilities
   - Must feel things to assist in any interpretation required.
   - Eyes not used to "steer" hand movements (extreme lack of orientation, placement of words, or drawings on page).
   - Writes crookedly, poorly spaced; cannot stay on ruled lines.
   - Misaligns both horizontal and vertical series of numbers.
   - Uses his hand or fingers to keep his place on the page.
   - Uses other hand as "spacer" to control spacing and alignment on page.
   - Repeatedly confuses left-right directions.

   D. Visual Form Perception (Visual Comparison, Visual Imagery, Visualization)
   - Mistakes words with same or similar beginnings.
   - Fails to recognize same word in next sentence.
   - Reverses letters and/or words in writing and copying.
   - Confuses likenesses and minor differences.
   - Confuses same word in same sentence.
   - Repeatedly confuses similar beginnings and endings of words.
   - Fails to visualize what is read either silently or orally.
   - Whispers to self for reinforcement while reading silently.
   - Returns to "drawing with fingers" to decide likes and differences.

   E. Refractive Status (Nearsightedness, Farsightedness, Focus Problems, etc.)
   - Comprehension reduces as reading continued; loses interest too quickly.
   - Mispronounces similar words as continues reading.
   - Blinks excessively at desk tasks and/or reading; not elsewhere.
   - Holds book too closely; face too close to desk surface.
   - Avoids all possible near-centered tasks.
   - Complains of discomfort in tasks that demand visual interpretation.
   - Closes or covers one eye when reading or doing desk work.
   - Makes errors in copying from chalkboard to paper on desk.
   - Makes errors in copying from reference book to notebook.
   - Squints to see chalkboard, or requests to move nearer.
   - Rubs eyes during or after short periods of visual activity.
   - Fatigues easily; blinks to make chalkboard clear up after desk task.

RESOURCES

American Optometric Association, 243 N. Lindberg Blvd., St. Louis MO 63141

College of Optometrists in Vision Development, P.O. Box 285, Chula Vista CA 92012

Optometric Extension Program Foundation, Inc. 1968. Duncan, OK 73533. Vision Information Catalog, Educator's Checklist, Observable Clues to Classroom Vision Problems.

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Vision—Its Impact on Learning. Edited by Robert M. Wold, O.D. 1978. Special Child Publications, a Division of Bernie Straub Publishing Co., 4535 Union Bay Place, NE, Seattle, WA 98105

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